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# New national and regional Annex I Habitat records: from #21 to #25

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## Abstract

New Italian data on the distribution of the Annex I Habitats 3170*, 6110*, 91E0*, 9320, 9330 are reported in this contribution. Specifically, one new occurrence in Natura 2000 sites is presented and six new cells are added in the European Environment Agency 10 km × 10 km reference grid. The new data refer to the Italian administrative regions of Sardinia, Sicily and Umbria.

## Keywords

3170*, 6110*, 91E0*, 9320, 9330, 92/43/EEC Directive, conservation, EEA, vegetation

## Introduction

This is the fifth contribution reporting records of new occurrences of Annex I Habitats in Europe. By comparing the results of the 4th Report ex-Art. 17 of Annex I Habitat Monitoring in Europe (Eionet 2019), these cell occurrences are newly recorded for Italy. The related phytosociological relevés of each contribution are reported and archived in the Italian database "VegItaly" (Gigante et al. 2012; Landucci et al. 2012).

## Habitats records

Following the standard format of Gigante et al. (2019a), all species data, site data and descriptions of the new habitat records are hereafter provided. We report a synthetic overview in Tab. 1. We used the open source QGIS Geographic Information System (QGIS.org 2020) for mapping purposes.

### #21. Annex I Habitat: 3170* Mediterranean temporary ponds (Caria M.C., Rivieccio G., Bagella S.)

***EUNIS Classification system***: Q52 (formerly: C3.4) Small-helophyte bed (Chytrý et al. 2020).
***Biogeographical Region***: Mediterranean
***National Habitat Checklist of reference***: Manuale Italiano di interpretazione degli habitat della Direttiva 92/43/CEE (Biondi et al. 2009).
***Phytosociological reference***: *Isoetion* Br.-Bl. 1936, *Isoetetalia* Br.-Bl. 1936, *Isoeto-Nanojuncetea* Br.-Bl. et Tüxen ex Westhoff, Dijk et Passchier (Biondi and Blasi 2015).

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**Table 1.** Synthetic overview of the newly reported data.

| Hab ID | Hab name | Cell ID | Country | BR | N2000 Site | Authors |
|---|---|---|---|---|---|---|
| 3170* | Mediterranen temporary ponds | 10kmE421N184 | Italy | MED | - | Caria M.C., Rivieccio G., Bagella S. |
| 6110* | Rupicolous calcareous or basophilic grasslands of the *Alysso-Sedion albi* | 10kmE454N218 | Italy | MED | - | Bonini F. |
| 91E0* | Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) | 10kmE425N196 | Italy | MED | - | Calvia G., Bonari G., Bacchetta G. |
| 9320 | *Olea* and *Ceratonia* forests | 10kmE455N161, 10kmE468N160 | Italy | MED | ITA010005, ITA010031 | Gianguzzi L., Bazan G. |
| 9330 | *Quercus suber* forests | 10kmE459N160 | Italy | MED | - | Bazan G., Gianguzzi L. |

***Geographic information***: Italy, Sardinia, Alta Marmilla, Mogoro, 127 m a.s.l. Coordinates: 39.650513 N, 8.774201 E (Tab. 2, Rel. 1); 39.650929 N, 8.774303 E (Tab. 2, Rel. 2); 39.650833 N, 8.774213 E (Tab. 2, Rel. 3); 39.652295 N, 8.774368 E (Tab. 2, Rel. 4).
***Cell ID in the EEA reference grid***: 10kmE421N184 (Fig. 1).
***Nature 2000 Site Code***: currently not included in any Natura 2000 Site.
***Phytosociological table***: Tab. 2; taxonomic nomenclature according to Bartolucci et al. (2018).
***Notes***: The habitat is located in the outer belt of Mediterranean temporary ponds and waterlogged soils in patchwork with the vegetation dominated by *Pistacia lentiscus* and *Myrtus communis* (Bagella et al. 2009) inside a private biological farm. As already reported in Rivieccio et al. (2020), the area is rich in wetlands, whose persistence is favored by traditional farming practices (Bagella et al. 2016).

## #22. Annex I Habitat: 6110* Rupicolous calcareous or basophilic grasslands of the *Alysso-Sedion albi* (Bonini F.)

***EUNIS Classification system***: R13 (formerly: E1.1) Cryptogam- and annual-dominated vegetation on calcareous and ultramafic rock outcrops (Chytrý et al. 2020).
***Biogeographical Region***: Mediterranean
***National Habitat Checklist of reference***: Manuale Italiano di interpretazione degli habitat della Direttiva 92/43/CEE (Biondi et al. 2009).

**Figure 1.** Distribution in Italy of the Habitat 3170*: in black the new cell, in grey the cells officially reported in the 4th Habitat report ex-Art. 17 (period 2013–2018), in white (black outline) the cells later reported for Sardinia region (Gigante et al. 2019a).

**Table 2.** Habitat 3170*.

| Relevé number | 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|
| Cell ID | 10kmE421N184 | 10kmE421N184 | 10kmE421N184 | 10kmE421N184 | |
| Latitude | 39.650513 | 39.650929 | 39.650833 | 39.652295 | |
| Longitude | 8.774201 | 8.774303 | 8.774213 | 8.774368 | |
| Date | 3/4/2021 | 3/4/2021 | 3/4/2021 | 5/12/2021 | |
| Area (m²) | 1 | 1 | 1 | 1 | |
| Altitude (m a.s.l.) | 127 | 127 | 127 | 127 | |
| Cover (%) | 75 | 80 | 70 | 50 | |
| Average vegetation height (m) | 0.15 | 0.15 | 0.15 | 0.2 | |
| Water depth (cm) | 0 | 0 | 0 | 0 | Presences |
| **Charact. and diff. taxa *Isoetion, Isoetetalia, Isoeto-Nanojuncetea*** | | | | | |
| ^*Isoetes histrix* Bory | 1 | 1 | 2 | 1 | 4 |
| *Isoetes gymnocarpa* (Gennari) A.Braun | 1 | 1 | 1 | 1 | 4 |
| ^*Agrostis pourretii* Willd. | 1 | 2 | 2 | 3 | 4 |
| *Romulea requienii* Parl. | 1 | 2 | 2 | r | 4 |
| *Lythrum hyssopifolia* L. | . | + | . | + | 2 |
| ^*Juncus bufonius* L. | . | . | . | 1 | 1 |
| ^*Juncus capitatus* Weigel | . | . | . | + | 1 |
| ^*Juncus pygmaeus* Rich. ex Thuill. | . | . | . | r | 1 |
| *Solenopsis laurentia* (L.) C.Presl | . | . | . | 2 | 1 |
| *Centaurium maritimum* (L.) Fritsch | . | . | . | r | 1 |
| *Isoëtes tiguliana* Gennari | . | . | . | + | 1 |
| *Isolepis cernua* (Vahl) Roem. & Schult. | . | . | . | r | 1 |
| *Juncus tingitanus* Maire & Weiller | . | . | . | 2 | 1 |
| *Lotus hispidus* DC. | . | . | . | r | 1 |
| **Other species** | | | | | |
| *Lysimachia foemina* (Mill.) U.Manns & Anderb. | 1 | 1 | 2 | r | 4 |
| *Romulea ligustica* Parl. | 2 | 2 | 2 | . | 3 |
| *Asphodelus ramosus* L. subsp. *ramosus* | 3 | 2 | 2 | . | 3 |
| *Cynosurus polybracteatus* Poiret | + | + | . | 1 | 2 |
| *Cynodon dactylon* (L.) Pers. | . | . | + | + | 2 |
| *Chamaemelum fuscatum* (Brot.) Vasc. | 1 | 1 | . | . | 2 |
| *Carex divisa* Huds. | + | + | . | . | 2 |
| *Romulea ramiflora* Ten. subsp. *ramiflora* | . | . | r | + | 2 |
| *Logfia gallica* (L.) Cosson & Germ. | . | + | + | . | 2 |
| *Phalaris coerulescens* Desf. | 1 | . | . | 3 | 2 |
| *Galactites tomentosus* Moench | + | . | . | . | 1 |
| *Gaudinia fragilis* (L.) P.Beauv. | . | . | . | + | 1 |
| *Euphorbia exigua* L. subsp. *exigua* | . | . | . | r | 1 |
| *Filago germanica* (L.) Huds. | + | . | . | . | 1 |
| *Lolium rigidum* Gaudin subsp. *rigidum* | . | . | . | r | 1 |
| *Carex flacca* Schreb. subsp. *erythrostachys* (Hoppe) Holub | . | . | . | r | 1 |
| *Linum usitatissimum* L. subsp. *angustifolium* (Huds.) Thell. | . | 1 | . | . | 1 |
| *Lotus conimbricensis* Brot. | . | + | . | . | 1 |
| *Taeniatherum caput-medusae* (L.) Nevski | . | . | . | r | 1 |
| *Aira caryophyllea* L. | . | . | . | + | 1 |
| *Macrobriza maxima* (L.) Tzvelev | . | . | . | + | 1 |
| *Ranunculus paludosus* Poir. | . | . | + | . | 1 |
| *Allium* sp. | . | 2 | . | . | 1 |

^ Reference plant species of the Habitat 3170*, from Biondi et al. (2009).

***Phytosociological reference***: *Sedum album*-dominated community, *Alysso alyssoidis-Sedion* Oberd. et T. Müller in T. Müller 1961, *Alysso-Sedetalia* Moravec 1967, *Sedo-Scleranthetea* Br.-Bl. 1955 (Mucina et al. 2016).

***Geographic information***: Italy, Umbria, Perugia, Spoleto, Colle Sant'Elia, 419 m a.s.l., Coordinates: 42.733544 N, 12.742532 E (Tab. 3, Rel. 1); 418 m a.s.l., Coordinates: 42.733744 N, 12.742815 E (Tab. 3, Rel. 2); 421 m a.s.l., Coordinates: 42.733384 N, 12.742358 E (Tab. 3, Rel. 3).

***Cells ID in the EEA reference grid***: 10kmE454N218 (Fig. 2).

***Natura 2000 Site Code***: currently not included in any Natura 2000 Site.

***Phytosociological table***: Tab. 3; taxonomic nomenclature according to Portale della Flora d'Italia (2020).

***Notes***: The vegetation of *Alysso-Sedion albi* for central Italy is little reported in the phytosociological literature and no *Sedum album*-dominated coenosis has been framed yet (Venanzoni & Gigante 1999; Di Pietro et al. 2006). The recorded community (Fig. 3) occurs on carbonate rocky outcrops below the "Rocca Albornoz" fortress, near the border of the Natura 2000 SAC IT5210064 "Monteluco di Spoleto", but outside. The Habitat spreads on the carbonatic rocks over an area of about 600 sqm. In several points it is invaded by the alien invasive *Ailanthus altissima* (Mill.) Swingle. The present finding occurred during

**Table 3.** Habitat 6110*.

| Relevé number | 1 | 2 | 3 | |
|---|---|---|---|---|
| Cell ID | 10kmE454N218 | 10kmE454N218 | 10kmE454N218 | |
| Latitude | 42.733544 | 42.733744 | 42.733384 | |
| Longitude | 12.742532 | 12.742815 | 12.742358 | |
| Date | 5/7/2021 | 5/7/2021 | 5/7/2021 | |
| Area ($m^2$) | 1 | 1 | 1 | |
| Altitude (m a.s.l.) | 419 | 418 | 421 | |
| Exposition (°) | 120 | 170 | 165 | |
| Slope (°) | 54 | 80 | 46 | |
| Cover (%) | 65 | 45 | 80 | |
| Rockiness (%) | 29 | 53 | 16 | |
| Stoniness (%) | 1 | 0 | 1 | |
| Moss cover (%) | 2 | 1 | 1 | |
| Bare soil (%) | 3 | 1 | 2 | Presences |
| **Charact. and diff. taxa *Alysso alyssoidis-Sedion, Alysso-Sedetalia, Sedo-Scleranthetea*** | | | | |
| ^*Sedum album* L. | 4 | 3 | 4 | 3 |
| *Petrorhagia saxifraga* (L.) Link subsp. *saxifraga* | + | + | r | 3 |
| ^*Petrosedum rupestre* (L.) P.V.Heath | . | 1 | 2 | 2 |
| ^*Sedum sexangulare* L. | 1 | . | . | 1 |
| *Sedum dasyphyllum* L. | . | 1 | . | 1 |
| **Other species** | | | | |
| *Lactuca viminea* (L.) J.Presl & C.Presl | 1 | r | 1 | 3 |
| *Geranium molle* L. | r | r | . | 2 |
| *Medicago minima* (L.) L. | + | . | + | 2 |
| *Micromeria graeca* (L.) Benth. ex Rchb. subsp. *tenuifolia* (Ten.) Nyman | + | 1 | . | 2 |
| *Anisantha diandra* (Roth) Tutin ex Tzvelev | . | . | 1 | 1 |
| *Artemisia alba* Turra | . | . | + | 1 |
| *Convolvulus cantabrica* L. | . | . | + | 1 |
| *Clinopodium nepeta* (L.) Kuntze | . | . | r | 1 |
| *Euphorbia helioscopia* L. subsp. *helioscopia* | . | . | r | 1 |
| *Reichardia picroides* (L.) Roth | . | . | r | 1 |
| *Sonchus asper* (L.) Hill | . | . | r | 1 |

^ Reference plant species of the Habitat 6110*, from Biondi et al. (2009).

**Figure 2.** Distribution in Italy of the Habitat 6110*: in black the new cell, in grey the cells officially reported in the 4th Habitat report ex-Art. 17 (period 2013–2018), in white (black outline) the cells later reported for Umbria region (Gigante et al. 2019b).

**Figure 3.** Habitat 6110* at Colle Sant'Elia (Spoleto, Perugia, Italy).

the surveys carried out with the financial contribution of the Life Integrated project "LIFE IMAGINE Umbria - Integrated MAnagement and Grant Investments for the N2000 NEtwork in Umbria".

## #23. Annex I Habitat: 91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) (Calvia G., Bonari G., Bacchetta G.)

***EUNIS 2020 classification system***: T14 (formerly: G1.3) Mediterranean and Macaronesian riparian forests (Chytrý et al. 2020).
***Biogeographical Region***: Mediterranean.
***National Habitat Checklist of reference***: Manuale Italiano di interpretazione degli habitat della Direttiva 92/43/CEE (Biondi et al. 2009).
***Phytosociological reference***: *Osmundo regalis-Alnetum glutinosae* Camarda 1995; *Osmundo-Alnion glutinosae* (Br.-Bl. et al. 1956) Dierschke et Rivas-Mart. in Rivas-Mart. 1975; *Populetalia albae* Br.-Bl. ex Tchou 1948; *Salici purpureae-Populetea nigrae* (Rivas-Mart. et Cantó ex Rivas-Mart. et al. 1991) Rivas-Mart. et Cantó 2002 (Biondi and Blasi 2015).
***Geographic information***: Italy, Sardinia, Berchidda, Rio Salomone, between 195 and 203 m a.s.l., Coordinates: 40.750385 N, 9.209475 E (Tab. 4, Rel. 1); 40.750466 N 9.209482 E (Tab. 4, Rel. 2); 40.750872 N, 9.210716 E (Tab. 4, Rel. 3); 40.750850 N, 9.210757 E (Tab. 4, Rel. 4); 40.750852 N, 9.210802 E (Tab. 4, Rel. 5); 40.751022 N, 9.210905 E (Tab. 4, Rel. 6); 40.751436 N, 9.211736 E (Tab. 4, Rel. 7); 40.751473 N, 9.211695 E (Tab. 4, Rel. 8); 40.751177 N, 9.211229 E (Tab. 4, Rel. 9).
***Cell ID in the EEA reference grid***: 10kmE425N196 (Fig. 4).
***Natura 2000 Site Code***: currently not included in any Natura 2000 Site.
***Phytosociological table***: Tab. 4; taxonomic nomenclature according to Bartolucci et al. (2018).
***Notes***: This priority habitat occurs scattered in the island of Sardinia (Bacchetta et al. 2009) and is often represented by the association *Osmundo regalis-Alnetum glutinosae* Camarda 1995. This is a typical association represented by edapho-hygrophilous meso-woods (10–20 m high) growing along oligotrophic rivers and streams, from the sea level up to 800 m of elevation. They are calcifuge formations linked to moist sandy to gravelly soils in the Mediterranean Oceanic Pluviseasonal bioclimate, with thermotypes ranging from the thermo-Mediterranean to the meso-Mediterranean and ombrotypes from lower subhumid to lower humid (Angius and Bacchetta 2009). It is classified within the W-Mediterranean alliance *Osmundo-Alnion glutinosae* (Br.-Bl. et al. 1956) Dierschke et Rivas-Mart. in Rivas-Mart. 1975 and the Tyrrhenian sub-alliance *Hyperico hircini-Alnenion glutinosae* Dierschke 1975 (Angius and Bacchetta 2009; Landi and Angiolini 2010). At the site here reported (Fig. 5), the trees of *Alnus glutinosa* are only occasionally dominant due to relatively recent wildfires and extreme rain events. For this reason, *Osmunda regalis* L. is often dominant, forming a dense undergrowth along streambanks and islets.

## #24. Annex I Habitat: 9320 *Olea* and *Ceratonia* forests (Gianguzzi L., Bazan G.)

***EUNIS Classification system***: T24 (formerly: G2.4) *Olea europaea-Ceratonia siliqua* forest (Chytrý et al. 2020).
***Biogeographical Region***: Mediterranean
***National Habitat Checklist of reference***: Manuale Italiano di interpretazione degli habitat della Direttiva 92/43/CEE (Biondi et al. 2009).
***Phytosociological reference***: *Chamaeropo humilis-Oleetum sylvestris* Gianguzzi et Bazan 2019 *acanthetosum mollis* Gianguzzi et Bazan 2019 (Tab. 2, Rel. 1); *Ruto chalepensis-Oleetum sylvestris* Gianguzzi et Bazan 2019 *oleetosum sylvestris* Gianguzzi et Bazan 2019 (Tab. 2, Rel. 2); *Oleo sylvestris-Ceratonion siliquae* Br.-Bl. ex Guinochet et Drouineau 1944; *Pistacio lentisci-Rhamnetalia alaterni* Rivas-Martínez 1975; *Quercetea ilicis* Br.-Bl. in Br.-Bl., Roussine et Nègre 1952 (Biondi and Blasi 2015).
***Geographic information***: Italy, Sicilia, Mazara del Vallo, Gorghi Tondi, 30 m a.s.l., Coordinates: 37.613763 N, 12.648103 E (Tab. 5, Rel. 1); Italy, Sicilia, Caltanissetta, Gulfi, 433 m a.s.l., Coordinates: 37.475271 N, 14.099069 E (Tab. 5, Rel. 2)

**Table 4.** Habitat 91E0*.

| Relevé number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cell ID | 10kmE425N196 | 10kmE425N196 | 10kmE425N196 | 10kmE425N196 | 10kmE425N196 | 10kmE425N196 | 10kmE425N196 | 10kmE425N196 | 10kmE425N196 | |
| Latitude | 40.750385 | 40.750466 | 40.750872 | 40.750850 | 40.750852 | 40.751022 | 40.751436 | 40.751473 | 40.751177 | |
| Longitude | 9.209475 | 9.209482 | 9.210716 | 9.210757 | 9.210802 | 9.210905 | 9.211736 | 9.211695 | 9.211229 | |
| Date | 8/18/2019 | 8/18/2019 | 8/18/2019 | 8/18/2019 | 8/18/2019 | 8/18/2019 | 8/18/2019 | 8/18/2019 | 8/18/2019 | |
| Area ($m^2$) | 25 | 16 | 16 | 16 | 25 | 25 | 20 | 16 | 9 | |
| Altitude (m a.s.l.) | 196 | 196 | 200 | 200 | 200 | 200 | 201 | 201 | 201 | |
| Canopy cover (%) | 100 | 100 | 100 | 100 | 90 | 100 | 95 | 85 | 85 | |
| Slope (°) | 7 | 10 | | | | | | | | |
| Exposition | W | W | | | | | | | | |
| Substrate | Granite | Granite | Granite | Granite | Granite | Granite | Granite | Granite | Granite | |
| Rockiness (%) | 10 | 20 | | | | | | | | |
| Vegetation average height (m) | 5.5 | 4.5 | 3 | 4 | 5 | 4.5 | 4 | 3.5 | 2 | |
| Stoniness (%) | 15 | 15 | 50 | 25 | 50 | 40 | 35 | 25 | 35 | |
| Number of species | 12 | 10 | 8 | 16 | 10 | 8 | 8 | 11 | 9 | Presences |
| **Diagnostic ass. *Osmundo regalis-Alnetum glutinosae*** | | | | | | | | | | |
| ^*Alnus glutinosa* (L.) Gaertn. | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 9 |
| *Smilax aspera* L. | 1 | 2 | . | 1 | + | + | . | . | 1 | 7 |
| ^*Carex microcarpa* Bertol. ex Moris | 1 | . | . | + | . | . | 1 | . | . | 3 |
| *Rhamnus alaternus* L. | 1 | 1 | . | . | . | . | . | . | . | 2 |
| *Cyperus badius* Desf. | | | | | | | | 1 | + | 2 |
| *Hypericum hircinum* L. subsp. *hircinum* | . | . | + | . | . | . | . | . | . | 1 |
| **Charact. subass. *salicetosum atrocinereae*** | | | | | | | | | | |
| ^*Salix atrocinerea* Brot. | + | 2 | . | 2 | 2 | 1 | 3 | . | 1 | 7 |
| **Charact. *Osmundo-Alnion*** | | | | | | | | | | |
| ^*Osmunda regalis* L. | 4 | 5 | 5 | 3 | 5 | 4 | 4 | 2 | 4 | 9 |
| *Erica terminalis* Salisb. | . | . | 1 | + | . | 1 | 2 | 1 | . | 5 |
| *Fraxinus ornus* L. | 2 | 1 | . | 1 | . | . | . | . | . | 3 |
| *Spiranthes aestivalis* (Poir.) Rich. | + | . | . | . | . | . | . | . | . | 1 |
| **Charact. *Salici purpureae-Populetea nigrae*** | | | | | | | | | | |
| ^*Salix purpurea* L. | . | . | . | 2 | . | 3 | 1 | 4 | 1 | 5 |
| *Vitis vinifera* L. subsp. *sylvestris* (Gmelin) Hegi | . | . | . | 1 | + | 2 | + | 1 | . | 5 |
| **Charact. *Quercetea ilicis*** | | | | | | | | | | |
| *Arbutus unedo* L | 2 | 1 | . | . | . | . | . | . | . | 2 |
| *Erica arborea* L. | 1 | + | . | . | . | . | . | . | . | 2 |
| *Pistacia lentiscus* L. | . | 2 | . | . | . | . | . | . | . | 1 |
| **Other species** | | | | | | | | | | |
| *Typha angustifolia* L. | . | . | + | + | 1 | . | . | . | 1 | 4 |
| *Rubus ulmifolius* Schott | + | + | . | + | . | . | . | + | . | 4 |
| *Lythrum salicaria* L. | . | . | 1 | + | . | . | . | + | . | 3 |
| *Mentha aquatica* L. | . | . | . | + | + | . | . | 1 | . | 3 |
| *Scirpoides holoschoenus* (L.) Soják | . | . | . | 1 | . | . | . | + | 2 | 3 |
| *Gratiola officinalis* L. | . | . | + | . | + | . | + | . | . | 3 |
| *Mentha pulegium* L. | . | . | . | . | + | + | . | . | . | 2 |
| *Elymus repens* (L.) Gould | . | . | . | + | . | . | . | . | + | 2 |
| *Carex panormitana* Guss. | . | . | + | . | + | . | . | . | . | 2 |
| *Dittrichia viscosa* (L.) Greuter | + | . | . | . | . | . | . | . | . | 1 |
| *Ludwigia palustris* (L.) Elliott | + | . | . | . | . | . | . | . | . | 1 |
| ^*Cladium mariscus* (L.) Pohl. | . | . | . | + | . | . | . | . | . | 1 |
| *Juncus acutus* L. | . | . | . | . | . | . | . | + | . | 1 |

^ Reference plant species of the Habitat 91E0*, from Biondi et al. (2009).

**Figure 4.** Distribution in Italy of the Habitat 91E0*: in black the new cell, in grey the cells officially reported in the 4th Habitat report ex-Art. 17 (period 2013–2018; Eionet 2019).

**Figure 5.** Habitat 91E0* along Rio Salomone river (Berchidda, Sassari, Italy).

**Table 5.** Habitat 9320.

| Relevé number | 1 | 2 | |
|---|---|---|---|
| Cell ID | 10kmE455N161 | 10kmE468N160 | |
| Latitude | 37.613763 | 37.613763 | |
| Longitude | 12.648103 | 12.648103 | |
| Date | 3/13/2021 | 3/13/2021 | |
| Area (m²) | 100 | 150 | |
| Altitude (m a.s.l.) | 30 | 433 | |
| Exposition | SE | SE | |
| Slope (°) | 6 | 15 | |
| Cover (%) | 90 | 100 | |
| Average vegetation height (m) | 4 | 4 | Presences |
| **Dominant species** | 5 | 5 | 2 |
| ^*Olea europaea* L. var. *sylvestris* (Mill.) Lehr. | | | |
| **Charact. and diff. of *Chamaeropo humilis-Oleetum sylvestris acanthetosum mollidis*** | | | |
| *Acanthus mollis* L. subsp. *mollis* | 2 | . | 1 |
| ^*Chamaerops humilis* L. | 2 | . | 1 |
| **Charact. and diff. of *Ruto chalepensis-Oleetum sylvestris oleetosum sylvestris*** | | | |
| ^*Pistacia terebinthus* L. subsp. *terebinthus* | . | 3 | 1 |
| *Ruta chalepensis* L. | . | 1 | 1 |
| **Charact. of *Pistacio lentisci-Rhamnetalia alaterni* and *Oleo sylvestris-Ceratonion siliquae*** | | | |
| *Pistacia lentiscus* L. | 3 | . | 1 |
| *Teucrium fruticans* L. subsp. *fruticans* | 2 | . | 1 |
| *Clematis cirrhosa* L. | 1 | . | 1 |
| ^*Stachys major* (L.) Bartolucci & Peruzzi | 1 | . | 1 |
| *Artemisia arborescens* (Vaill.) L. | + | 1 | 2 |
| *Rhamnus lycioides* subsp. *oleoides* (L.) Jahand. & Maire | + | . | 1 |
| *Quercus calliprinos* Webb | + | . | 1 |
| ^*Asparagus albus* L | + | . | 1 |
| **Charact. of *Quercetea ilicis*** | | | |
| ^*Asparagus acutifolius* L. | 1 | 2 | 2 |
| *Ampelodesmos mauritanicus* (Poir.) T.Durand & Schinz | 1 | + | 2 |
| *Rubia peregrina* L. | 1 | . | 1 |
| *Hedera helix* L. subsp. *helix* | 1 | . | 1 |
| ^*Lonicera implexa* Aiton | 1 | . | 1 |
| *Smilax aspera* L. | + | . | 1 |
| *Euphorbia characias* L. | . | 2 | 1 |
| ^*Rhamnus alaternus* L. | . | 2 | 1 |
| *Arisarum vulgare* O.Targ.Tozz. subsp. *vulgare* | . | 1 | 1 |
| *Quercus virgiliana* Ten. | . | + | 1 |
| **Other species** | | | |
| *Capparis spinosa* L. | 1 | . | 1 |
| *Oloptum miliaceum* (L.) Röser & H.R.Hamasha | 1 | . | 1 |
| *Parietaria judaica* L. | 1 | . | 1 |
| *Brachypodium retusum* (Pers.) P.Beauv. | + | . | 1 |
| *Daucus carota* L. subsp. *carota* | + | . | 1 |
| *Ferula communis* L. subsp. *communis* | + | . | 1 |
| *Foeniculum vulgare* Mill. subsp. *vulgare* | + | . | 1 |
| *Bituminaria bituminosa* (L.) E.H.Stirt. | + | . | 1 |
| *Avena barbata* Pott ex Link | + | . | 1 |
| *Salvia rosmarinus* Schleid. | + | . | 1 |
| *Dittrichia viscosa* (L.) Greuter | + | . | 1 |
| *Thymus spinulosus* Ten. | + | . | 1 |
| *Diplotaxis tenuifolia* (L.) Dc. | + | . | 1 |
| *Dactylis glomerata* subsp. *hispanica* (Roth) Nyman | . | 2 | 1 |
| *Hyparrhenia hirta* (L.) Stapf subsp. *hirta* | . | 2 | 1 |
| *Capparis sicula* Veill. | . | 2 | 1 |
| *Sedum dasyphyllum* L. | . | 1 | 1 |
| *Crataegus monogyna* Jacq. | . | 1 | 1 |
| *Arundo plinii* Turra | . | 1 | 1 |
| *Asphodelus ramosus* L. | . | + | 1 |
| *Mandragora autumnalis* Bertol. | . | + | 1 |

^ Reference plant species of the Habitat 9320, from Biondi et al. (2009).

**Figure 6.** Distribution in Italy of the Habitat 9320: in black the new cell, in grey the cells officially reported in the 4th Habitat report ex-Art. 17 (period 2013–2018), in white (black outline) the cells later reported for Sicily region (Gianguzzi et al. 2020).

***Cell ID in the EEA reference grid***: 10kmE455N161 (Tab. 5, Rel. 1); 10kmE468N160 (Tab. 5, Rel. 2) (Fig. 6).
***Natura 2000 Site Code***: The stand of Rel. 1 is included in the SAC ITA010005 "Laghetti di Preola e Gorghi Tondi e Sciare di Mazara" and SPA ITA010031 "Laghetti di Preola e Gorghi Tondi, Sciare di Mazara e Pantano Leone"; the stand of Rel. 2 is currently not included in any Natura 2000 Site.
***Phytosociological table***: Tab. 5; taxonomic nomenclature according to Bartolucci et al. (2018).
***Notes***: The phytosociological interpretation of *Olea europaea* L. var. *sylvestris* (Mill.) Lehr. communities by Gianguzzi and Bazan (2019, 2020) has allowed a correct interpretation and an update of distribution of the Habitat 9320 in Sicily (Gianguzzi et al. 2020). In the Region, botanical and phytosociological research have indeed provided new insights into the status and distribution of habitat and species for the implementation of the 4th Italian Report of Habitats (e.g., Troia et al. 2012; De Castro et al. 2015; Gianguzzi et al. 2013, 2014a, 2014b, 2015, 2016).

Recent surveys have provided two new records of 9320 habitat in Sicily referred to *Chamaeropo humilis-Oleetum sylvestris acanthetosum mollis* and *Ruto chalepensis-Oleetum sylvestris oleetosum sylvestris*. The second phytocoenosis represents the first record of a wild olive formation growing on gypsum substrates. Its location outside Natura 2000 network should receive special attention.

## #25. Annex I Habitat: 9330 *Quercus suber* forests (Bazan G., Gianguzzi L.)

***EUNIS Classification system***: T21 (formerly: G2.1) Mediterranean evergreen *Quercus* forest (Chytrý et al. 2020).
***Biogeographical Region***: Mediterranean
***National Habitat Checklist of reference***: Manuale Italiano di interpretazione degli habitat della Direttiva 92/43/CEE (Biondi et al. 2009).
***Phytosociological reference***: *Genisto aristatae-Quercetum suberis* Brullo 1984 *pistacietosum lentisci* Brullo, Gianguzzi, La Mantia et Siracusa 2008; *Erico arboreae-Quercion ilicis* Brullo, Di Martino et Marcenò 1977; *Quercetalia ilicis* Br.-Bl. ex Molinier 1934; *Quercetea ilicis* Br.-Bl. in Br.-Bl., Roussine et Nègre 1952 (Biondi and Blasi 2015).
***Geographic information***: Italy, Sicilia, Sciacca, Sovareto, 50 m a.s.l., Coordinates: 37.500410 N, 13.121535 E (Tab. 6, Rel. 1); Coordinates: 37.500605 N, 13.121616 E (Tab. 6, Rel. 2).
***Cell ID in the EEA reference grid***: 10kmE459N160 (Fig. 7).
***Natura 2000 Site Code***: currently not included in any Natura 2000 Site.
***Phytosociological table***: Tab. 6; taxonomic nomenclature according to Bartolucci et al. (2018).
***Notes***: The Habitat identified is a remnant linear strip of cork oak vegetation, located in xeric conditions of the coastal area of south-west Sicily. The phytocoenosis has been assigned to *Genisto aristatae-Quercetum suberis pistacietosum lentisci*, which is differentiated from the sub-

**Table 6.** Habitat 9330.

| Relevé number | 1 | 2 | |
|---|---|---|---|
| Cell ID | 10kmE459N160 | 10kmE459N160 | |
| Latitude | 37.500.410 | 37.475.271 | |
| Longitude | 13.121.535 | 14.099.069 | |
| Date | 3/13/2021 | 3/13/2021 | |
| Area (m²) | 150 | 150 | |
| Altitude (m a.s.l.) | 50 | 51 | |
| Exposition | S | S | |
| Slope (°) | 1 | 1 | |
| Cover (%) | 100 | 100 | |
| Average vegetation height (m) | 6 | 4 | Presences |
| **Charact. taxa of *Genisto aristatae-Quercetum suberis pistacietosum lentisci*** | | | |
| ^*Quercus suber* L. | 4 | 3 | 2 |
| *Pistacia lentiscus* L. | 2 | 2 | 2 |
| *Olea europaea* L. var. *sylvestris* (Mill.) Lehr. | 1 | 2 | 2 |
| *Teucrium fruticans* L. subsp. *fruticans* | + | 1 | 2 |
| **Charact. *Erico-Quercion ilicis*** | | | |
| ^*Myrtus communis* L. | . | 1 | 1 |
| **Charact. *Quercetalia ilicis* and *Quercetea ilicis*** | | | |
| *Rubia peregrina* L. | 1 | 1 | 2 |
| *Smilax aspera* L. | 1 | 1 | 2 |
| *Asparagus acutifolius* L. | + | + | 2 |
| **Other species** | | | |
| *Rubus ulmifolius* Schott | 1 | 1 | 2 |
| *Reichardia picroides* (L.) Roth | + | + | 2 |
| *Oloptum miliaceum* (L.) Röser & H.R.Hamasha | + | + | 2 |
| *Ceratonia siliqua* L. | 2 | . | 1 |
| ^*Cistus salvifolius* L. | . | 1 | 1 |
| *Spartium junceum* L. | . | 1 | 1 |
| *Hyparrhenia hirta* (L.) Stapf subsp. *hirta* | . | + | 1 |

^ Reference plant species of the Habitat 9330, from Biondi et al. (2009).

**Figure 7.** Distribution in Italy of the Habitat 9330: in black the new cell, in grey the cells officially reported in the 4th Habitat report ex-Art. 17 (period 2013-2018; Eionet 2019).

**Figure 8.** Habitat 9330, relict aspects of *Quercus suber* formation in Contrada Sovareto (Sciacca, SW-Sicily, Italy).

association typicum by the absence of *Genista aristata* (Marino et al. 2012) and the frequency of thermophilous species (Brullo et al. 2008).

It is the last vestiges of a *Quercus suber* forest (Fig. 8) that historically covered this area (Stieler 1880) which is named in Sicilian dialect Suvarito (meaning the cork oak forest). Nowadays, the formation is within a large tourist resort which, indirectly, has contributed protecting it. However, the community should receive special attention as it is located outside the Natura 2000 network sites.

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